

## **CODE OF PRACTICE**

### **Code of practice: Amenity tree industry**

May 1998

This may be cited as the Code of Practice For The Amenity Tree Industry.

This code provides practical guidance on safety requirements for the amenity tree industry. It is intended as a guide to the public and private sectors in meeting their requirements under the Occupational Health and Safety Act 1983. It is not intended to be a training manual for the amenity tree industry.

This code applies to the amenity tree industry for pruning, trimming, repairing, maintaining, transplanting and removing trees and for wood chipping, stump grinding and for equipment used in such operations.

This code does not apply to commercial forestry.

This code commences on 1st August 1998.

This is an industry code of practice approved by the Minister for Industrial Relations in accordance with section 44A of the Occupational Health and Safety Act 1983. It will be reviewed within five years of its commencement.

## **1. Introduction**

### **1.1 What is a Code of Practice?**

An approved Industry Code of Practice is a practical guide to achieving minimum standards of health and safety required by the Occupational Health and Safety Act 1983. It should be followed unless there is an alternative course of action which achieves the same or better standards of health and safety in the workplace. It could also be used as a guideline in the investigation of an accident in the workplace.

### **1.2 Who should use this Code of Practice?**

This code has been developed for all people who work in the amenity tree industry; that is all people who work with trees except those involved in commercial forestry. This could include, but is not limited to, the following occupations: arborists, tree climbers, tree loppers, gardeners, horticulturists, landscapers, tree workers, builders and developers, earth movers and site clearers, firewood contractors, tree transplanters, stump grinders and wood chippers.

### **1.3 Why has this code been developed?**

The simple answer is that TREE WORK IS HAZARDOUS. The industry is full of hazards ranging from the tree itself, to the weather, the terrain and difficult sites in which tree work is carried out. Each year, many people in the tree industry are killed or injured.

Apart from the enormous impact of injury on individuals and their families, accidents cost the community a significant amount of money. The relatively high incidence of injuries is reflected in the high rates for workers compensation insurance premiums.

When injuries are analysed, the overwhelming majority could have been prevented by following the simple safety procedures outlined in this Code of Practice.

### **1.4 Who developed this code?**

This code was developed by representatives from the amenity tree industry in conjunction with WorkCover NSW. The development committee came from the following organisations:

- Australian Workers Union
- Centennial Park and Moore Park Trust
- Local Government Tree Resources Association
- National Arborists Association of Australia
- Rope Access Association of NSW
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- Ryde College of TAFE, Division of Horticulture
- Tree Contractors Association

## **1.5 How to use this code**

The code includes provisions for:

- general safety issues
- equipment used in the amenity tree industry
- safe work practices.

The equipment discussed includes:

- ropes and climbing equipment
- chainsaws
- elevated work platforms
- cranes
- stump grinders
- chippers.

The section on safe work practices covers climbing, ground work and the operation of equipment.

Throughout the code some words appear in bold print. These words have definitions which are listed in the back of the booklet under Chapter 14 Terminology.

## **2. Legal responsibilities**

### **2.1 Employers**

Under the OHS Act, employers have a duty of care for all their employees and any other people at their place of work. Employers must ensure that the place of work, and any work done in it, is focussed upon health and safety.

A place of work is any place where someone is working. This includes any place where work is being done on a tree.

An employer must:

- provide safe systems of work
- provide safe plant (equipment)
- ensure that plant can be used, handled, stored and transported safely
- provide adequate information, instruction, training and supervision.

To the extent that an employer controls a place of work, they must:

- maintain the place of work in a safe condition
- provide and maintain safe ways of entering and leaving the place of work.

### **2.2 Self employed and contractors**

Self employed people including contractors have similar legal obligations to employers.

They must ensure the health and safety of all people at their place of work including other contractors, any employees of other contractors and any other people who are at the place of work.

### **2.3 Employees**

Employees also have legal obligations. They must:

- co-operate with their employer and any other employers or contractors at the place of work who have legal obligations for

health and safety

- take reasonable care for the health and safety of any people at the place of work.

### **3. Planning and preparation**

#### **3.1 Nominated competent person**

Before work starts, a competent person should be nominated to plan and control the work.

A competent person is one who has experience in the work being done. They also have the skills and knowledge needed to:

- identify any potential hazards
- assess the risks of injury
- plan the work so risks are controlled.

Where appropriate, more than one person on site should have the experience, skills and knowledge to act as the nominated competent person.

#### **3.2 Consultation**

The nominated competent person should consult with the people who will be doing the work (or their representative) about how to do the work safely.

Remember:

- Plan the work
- Identify hazards
- Assess risks
- Control risks
- Review control measures

#### **3.3 Planning**

When planning the work the nominated competent person should consider:

- the equipment needed to do the work safely, and its availability
- the experience, fitness and skills needed by the people doing the work
- the number of people needed to do the work safely, particularly taking account of work site safety in public places
- the control of pedestrian and vehicular traffic
- the location of above and below ground services
- the size of the area to be designated as a safe working zone
- the involvement of authorities such as WorkCover, local government, electricity, fire, police and the ambulance service.

#### **3.4 Review**

Safety measures should be reviewed when work is finished, or if conditions change. This is particularly important if a dangerous situation occurs, or if someone is injured.

In many cases a range of control methods must be used to control hazards. This page lists various strategies which should be considered. The list is in order of preference. It is known as the hierarchy of hazard controls.

#### **3.5 Engineering controls**

- Design. Try to ensure that hazards are 'designed out' when new materials, equipment and work systems are being planned for the workplace.
- Remove the hazard or substitute less hazardous materials, equipment or substances.

- Adopt a safer process. Alterations to tools, equipment or work systems can often make them much safer.
- Enclose or isolate the hazard through the use of guards or remote handling techniques.
- Provide effective ventilation through local or general exhaust ventilation systems.

### **3.6 Administrative controls**

- Establish appropriate administrative procedures such as:
- job rotation to reduce exposure or boredom; or timing the job so that fewer workers are exposed
- routine maintenance and housekeeping procedures
- training on hazards and correct work procedures
- provide suitable and properly maintained personal protective equipment and training in its use.

## **4. General safety**

### **4.1 Controlling risks**

Risks are different on every site. Risks must be eliminated if possible. If it is not practical to eliminate risks, they should be reduced to a minimum.

The safest way to work will vary from job to job. The following questions can help work out the safest way to work:

- can the risk be eliminated - for example: can electric power be turned off?
- can people be kept away from a hazard - such as setting a safe working distance from power lines?
- what personal protective equipment is required, such as harnesses or safety helmets?

Refer Appendix - "Hazard Assessment Checklist".

### **4.2 Training and instruction**

Before work starts, the nominated competent person must ensure that all people doing the work are adequately trained and have been given specific instructions on how to do the work safely.

### **4.3 Fitness**

Tree workers and their supervisors should be physically fit and mentally alert.

People should not work if they are under the influence of alcohol or non-prescribed drugs. Any person taking prescribed drugs should be aware of possible side effects and work within those constraints.

### **4.4 First aid**

The *Occupational Health and Safety (First Aid) Regulation 1989* requires employers to provide a first aid kit approved by WorkCover. This first aid kit must be maintained and kept fully stocked. It should always be available on site. Contractors should also ensure that there is a first aid kit on site. At least one person on site should have a current first aid certificate.

### **4.5 Emergency procedures**

Documented emergency procedures should be kept on site at all times. All people on the site should be familiar with the emergency procedures and have any necessary training.

Every site should have access to emergency communication and transport.

### **4.6 Traffic control**

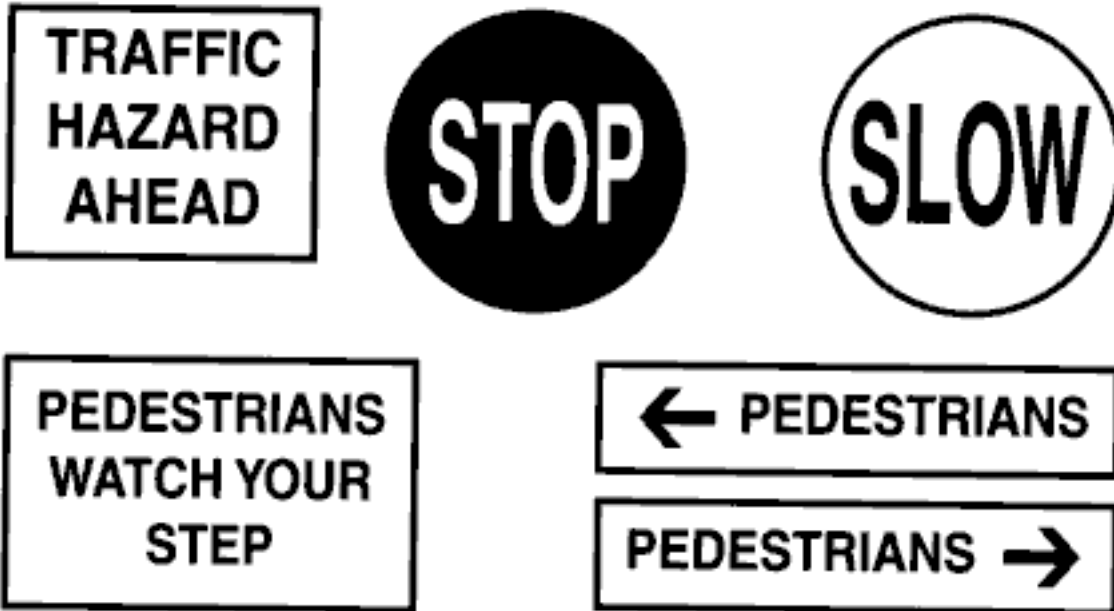
The Police Service and Local Councils have control of pedestrian and vehicular traffic. They should be consulted before any tree work is undertaken which could endanger traffic. In some circumstances permits may be required.

Effective means for the control of pedestrian and vehicle traffic should be established on every job site where necessary. Where appropriate further information should be sought from the Roads and Traffic Authority (RTA), the Police and any other relevant

authorities.

Australian Standard AS1742-3 *Traffic Control Devices For Works on Roads* provides information on traffic control.

Some traffic warning  
and diversion signs



*Some traffic warning and diversion signs*

## 5. Fire protection

### 5.1 Flammable liquids

Flammable liquids - such as petrol - must be stored, handled and dispensed from approved containers or safety cans.

Petrol driven equipment can start fires. Appropriate precautions must be taken if there is a risk of fire; for example, when cutting trees in bushland. These precautions include the provision of fire extinguishers. When using petrol powered equipment:

- stop the equipment before refuelling
- remove any spilt fuel before restarting the equipment
- do not operate the equipment within three metres of a refuelling area.

### 5.2 Smoking

Always remember, don't smoke when working near flammable liquids.

### 5.3 Further information

Information on fire prevention and dangerous goods can be found in the following Australian Standards - AS1842 *Portable Fire Extinguishers - Water (stored pressure type)*, AS1846 *Portable Fire Extinguishers - Powder Type* and AS1848 *Portable Fire Extinguishers - Halon Type*. Also consult the *Dangerous Goods Act 1975* and Regulation.

Dangerous goods are materials presenting a safety hazard because of their chemical or physical properties. They may be capable of

causing immediate harm because they are flammable, poisonous, corrosive (acid or alkaline) or explosive. They can be stored, handled and used safely if the proper precautions are taken.



*Do not smoke when refuelling*

## **6. Personal protective equipment**

### **6.1 When to use PPE**

Personal protective equipment (PPE) is any equipment which a person uses to protect them from a risk of illness or injury. Examples are steel capped boots, harnesses and head protection.

Employees must co-operate with their employer and use PPE if directed to use it. Employees should be trained in the use, care and maintenance of PPE. They should also be trained to identify workplace situations in which PPE should be used.

### **6.2 Head and eye protection**

All people engaged in amenity tree work should wear head and eye protection.

Australian Standard AS 1801 *Industrial Safety Helmets* gives information about head protection.

Australian Standard AS 1337 *Eye Protectors For Industrial Applications* gives information about eye protection.

### **6.3 Noise**

The *Occupational Health and Safety (Noise) Regulation 1996* includes provisions that employees must not be exposed to noise which exceeds 85dB(A) over an 8 hour period or which exceeds a peak level of 140 dB(lin). Excessive noise levels may occur when using machinery such as chainsaws, woodchippers and stump grinders. The noise rating of all equipment should be known and this information should be available to employees. If it is not practicable to reduce the noise of a machine, hearing protection should be worn. Further information on controlling noise exposure can be found in the WorkCover approved *Code of Practice For Noise Management and Protection of Hearing at Work* and in AS1270 *Acoustics - Hearing Protection*.

## 6.4 Clothing

Leg protection such as cut-resistant trousers or chaps should be worn where appropriate.

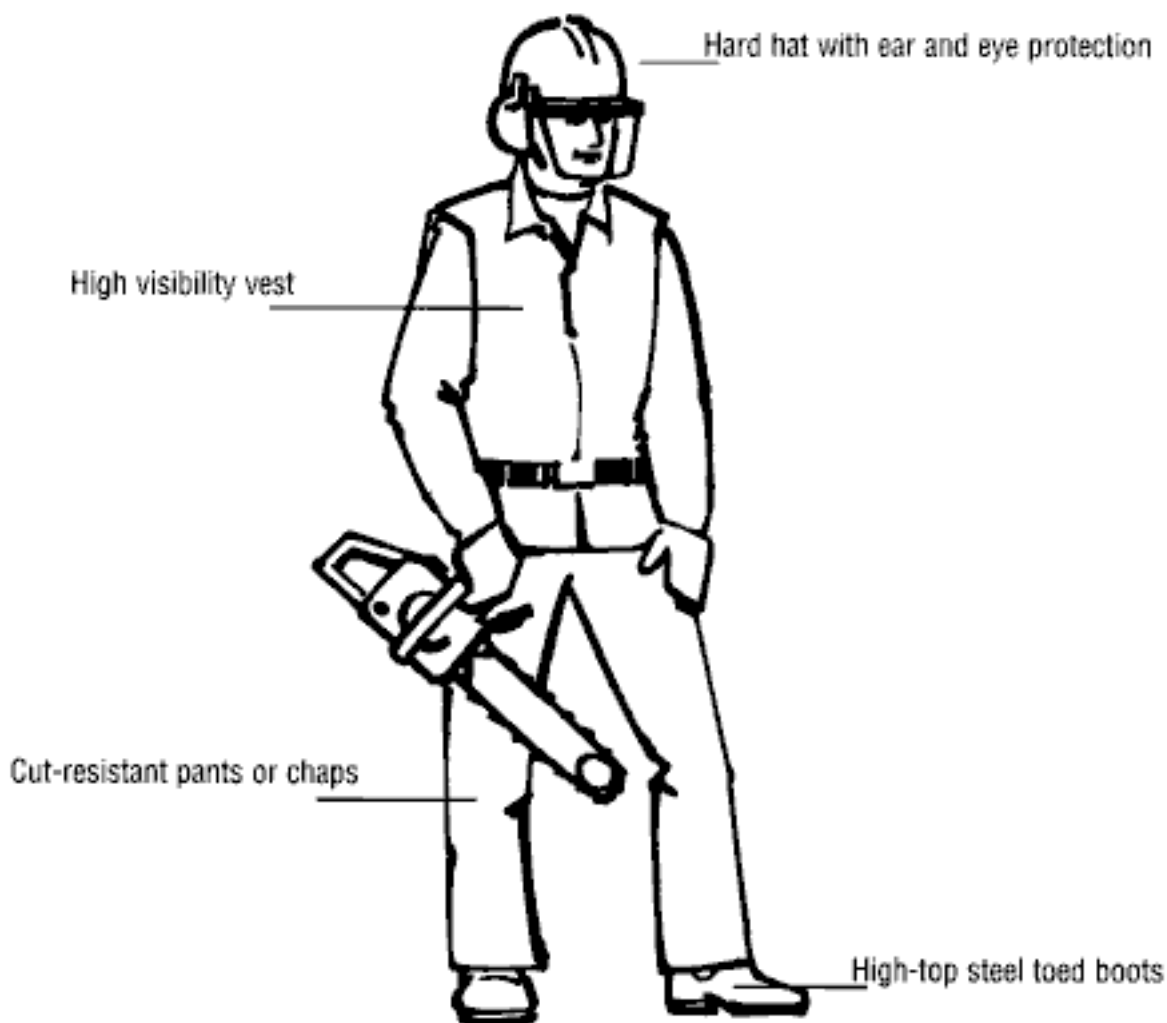
High visibility clothing should be worn where appropriate.

All people engaged in tree work should wear strong footwear, preferably steel capped with ankle support and deep non-slip tread.

Climbers and chainsaw operators should wear cotton or natural fibre clothing in preference to synthetics. Clothing and footwear should be appropriate to the work location and conditions. Loose clothing should be avoided.

## 6.5 Sun protection

Sun protection including SPF15+ sunscreen, long sleeved shirts and hats should be worn. AS 2604 *Sunscreen products - evaluation and classification* explains how to determine the performance of sunscreen products.



## 7. Electrical safety

The dangers of electricity cannot be overstated. Most people know that contact with electricity can cause electrocution and death.

Electric shock can cause:

- burns (internal and external)
- cardiac arrest
- loss of consciousness
- asphyxiation
- death by electrocution.

Live powerlines (whether overhead or underground) are a major hazard particularly in the amenity tree industry and have caused the deaths of a number of industry workers. In addition to direct electric shock and possible electrocution, contact with overhead powerlines in particular can lead to a variety of hazardous conditions such as:

- fire
- unpredictable cable whiplash
- a rain of molten metal caused by contact between an energised conductor and another conducting medium
- electrifying of other objects such as signs, poles, trees or tree branches - contact with an electrified object can lead to electric shock or electrocution

### **7.1 General advice**

Special precautions should be taken when work is done in the vicinity of powerlines whether they are overhead or underground. The same thing applies to work done near any electrical conductor or electrical apparatus or plant such as a transformer or sub-station.

A powerline or electrical conductor should always be assumed to be energised or 'live'. If a communication cable or wire is encountered, it should never be assumed that the operating voltage is harmless.

A tree or branch of a tree can conduct electricity even in dry conditions and it should never be assumed that a tree branch can safely rest on or against a powerline.

Care should be exercised particularly when plant is operated near electrical conductors. Plant that comes into contact with an overhead or underground cable may become electrified and pose a serious danger to the operator and any bystanders.

### **7.2 Electrical hazard tree work**

The guidance provided in this section applies to all 'electrical hazard tree work'. This means any work done by a worker in the amenity tree industry in any of the following circumstances:

- Where the work would bring the worker directly within the 'danger zone' - the 'danger zone' is explained below.
- Where the work relies on the operation of plant and the plant or any part of it would come within the 'danger zone' when set up or positioned or when operated.
- Where anything carried by or loaded on plant being operated to undertake the work would come within the 'danger zone' - this could be a tree branch or other plant such as a hand-saw or a chainsaw.
- Where some part of a tree or tree branch to be cut is within the 'danger zone' even though the worker working on the tree or branch may be well outside the zone.
- Where a tree or tree branch would come within the 'danger zone' in the process of it being cut or removed, or after it is cut.

### **7.3 The "danger zone"**

The "danger zone" is a defined zone around a powerline, electrical conductor, cable or electrical apparatus. The minimum clearance or safe working distance which defines the boundary of the zone depends on the voltage of the powerline or conductor.

The danger zone is specified in the following table:

**Zone**

**Nominal range**

**Minimum safe working distance**

**1**

**Up to 132,000 volts**

**3 metres**

**2**

**More than 132,000 but not more than 330,000 volts**

**6 metres**

**3**

**More than 330,000 volts**

**8 metres**

Zone

Nominal range

Minimum safe working distance

1

Up to 132,000 volts

3 metres

2

More than 132,000 but not more than 330,000 volts

6 metres

3

More than 330,000 volts

8 metres

Note: The distances shown in this table are based on the close proximity distances established by Regulation 133A of the *Construction Safety Regulations 1950*.

## **7.4 Identify the supply authority**

Where work has to be carried out in the vicinity of live powerlines or other electrical conductors or apparatus, it is imperative that the type of cable and the operating voltage be established. If there is any doubt, contact the relevant electricity supply authority or the owner of the cable.

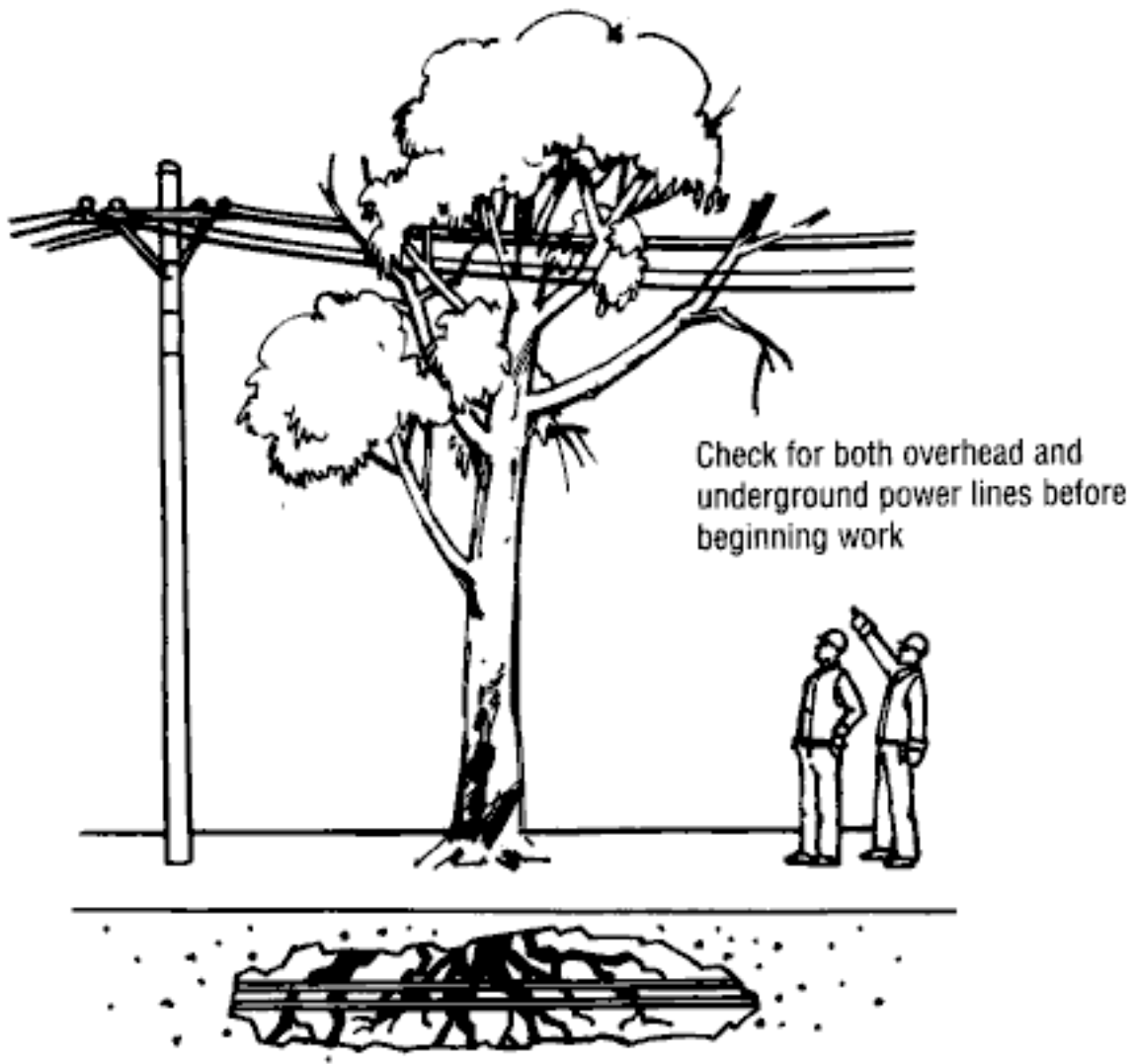
Before doing any electrical hazard tree work, contact the relevant authority to ensure that suitable arrangements can be made for the work to be carried out safely and without risks. This should be done even in cases of emergency and in storm situations.

Where the work involves excavation, stump removal or installation of root barriers, the relevant authority should be contacted to identify and locate any underground mains that may be nearby. It may be necessary to ask the supply authority to hand dig to locate the cables and possibly to carry out any excavation entirely by hand.

## **7.5 Training**

Adequate training is considered to be one of the most reliable risk control measures and its importance is worth emphasizing. In particular, training should be provided:

- to anyone who does electrical hazard tree work - this should be to the standard specified by Exemption 5099
- to anyone who has to use or operate plant - this should be appropriate to the type of plant
- to anyone expected to apply emergency procedures - special training is needed for this.



*Check for both overhead and underground power lines before beginning work*

## 7.6 Electrical safety tips

- Look out for powerlines passing through the crown of a tree or nearby
- Always assume that an electric cable is 'live' with a potentially lethal voltage
- Never touch a cable either directly or indirectly
- Identify electrical hazards and assess the risks before starting work
- Never work inside the 'danger zone' or do electrical hazard tree work unless certain conditions are met

## 7.7 Work inside the "danger zone"

No-one should work inside the 'danger zone' or do any electrical hazard tree work unless the following conditions are met:

- The person doing the work is appropriately trained
- An observer is present while the work is being done

Being appropriately trained means being trained to work in circumstances in which special measures are needed to deal with the risk of contact with electricity. The kind of training that is considered appropriate for electrical hazard tree work is described in what is called Exemption 5099 - this is explained below.

The function of the observer should be to observe the work being carried out and to warn of any risk of contact with a nearby cable or of any hazardous conditions that may develop in the course of the work or of any danger arising for the worker doing the work or anyone else who may be affected. The observer's duties should be as described in Regulation 133A of the *Construction Safety Regulations* - see below.

## 7.8 Legislative requirements - Regulation 133A

NSW legislation which people engaged in the amenity tree industry should know about includes Regulation 133A of the *Construction Safety Regulations* which deals specifically with certain activities near electrical apparatus. This Regulation established the same danger zones as those described in the foregoing table and it imposes certain requirements to be met in the case of such activities. The requirements of Regulation 133A apply to electrical hazard tree work carried out in certain circumstances. This includes work that involves the operation of plant such as a crane or elevating work platform. It also includes work involving the operation of powered plant like a chain-saw. In the case of such work, the appointment and presence of an observer is a requirement of Regulation 133A. The Regulation specifies the duties of the observer.

This and the other requirements imposed by Regulation 133A (such as the fixing of certain signs to plant) must be met where such work is done unless an exemption from the requirements granted by WorkCover applies to the work.

WorkCover should be consulted if there is any doubt about whether any particular electrical hazard tree work is subject to the Regulation 133A requirements.

## 7.9 Exemptions

WorkCover has the power under the provisions of the *Construction Safety Regulations* to grant an exemption from any of the requirements of Regulation 133A. There are certain conditions WorkCover must satisfy before any exemption can be granted in response to an application. WorkCover can attach conditions to the granting of an exemption. These have to be met for the exemption to be effective.

## 7.10 Exemption 5099

An exemption from the requirements of Regulation 133A currently operates. This was granted some time ago and it is called Exemption 5099. Exemption 5099 applies to certain plant - ie plant to which the Regulation applies - used by the various electricity supply authorities and certain other organisations whose employees ordinarily have to do work actually on or very close to electrical conductors or apparatus. It also applies to the use of the same kinds of plant by anyone who is contracted to any of these organisations to carry out tree work.

Exemption 5099 allows the plant to be used closer to electrical conductors or apparatus than the edge of the danger zone so long as the special conditions attached to the exemption are met. These conditions include the completion of certified training up to the required standard and also an annual refresher training course.

Information about the application and terms of Exemption 5099 could be obtained from any of the organisations covered by the exemption. Alternatively, WorkCover could be consulted.

## 7.11 Emergencies

Whenever an electrical accident or incident happens or someone has received an electric shock and become disabled, there are special procedures that should be observed. In particular, no-one should attempt a resuscitation of an electric shock victim unless the person has been specially trained to do this. To begin with, no attempt should be made to resuscitate a victim of electric shock unless the victim has been thrown clear of the electrical conductors or apparatus. The safety of the rescuer must be ensured.

If an elevating work platform, or the person working from it, comes into contact with a live low-voltage cable, the bucket may be lowered by using the pedestal controls. Since the vehicle itself could be 'live', extreme care should be taken at all times. No attempt should be made to jump onto the plant during this lowering process.

If power-lines have been brought down, it is important to know that the supporting surface, even the road or ground, could be electrified around the point of contact. The following procedures should be observed:

- keep well clear of the fallen lines
- issue a warning to any bystanders
- guard the fallen lines until they have been made safe
- notify the relevant electricity supply authority or, if appropriate, the owner of the cable(s)
- assist any electric shock victims but only if it is safe to do so and subject to the advice above
- ensure that help is summoned.

If a conductor has been struck by a falling tree or tree branch or by any plant or equipment, the relevant electrical supply authority should be notified so that the safety of the conductor can be investigated by the authority. Someone should stand guard at the location.

Plant that has been involved in an electrical accident or incident, should not be used again unless and until it has been checked for damage and it has been established that it is safe to be used.

## 8. Hazardous substances

Employers have a legal obligation under Section 15 of the *Occupational Health and Safety Act 1983*, to identify and assess the hazards associated with the storage and safe use of poisons, herbicides and pesticides, and to inform their employees accordingly. Appropriate strategies (such as PPE for each substance) should then be adopted to ensure their safe usage. The *Pesticide Act 1978* also applies to registered pesticides. This Act is administered by the Environment Protection Authority.

### 8.1 Hazardous Substances Regulation

Poisons and most herbicides and pesticides are classified as hazardous substances. The requirements for using hazardous substances are set out in the *Occupational Health and Safety (Hazardous Substances) Regulation 1996*. Note that the Pesticides Act operates in addition to this Regulation.

### 8.2 MSDS

Under the *Hazardous Substances Regulation*, manufacturers of hazardous substances must prepare a Material Safety Data Sheet (MSDS) which sets out information about any hazards associated with the substance and how to use the substance safely.

### 8.3 Using hazardous substances safely

Employers and self employed people must identify any hazardous substances used at work and assess the risks using information in the MSDS and on the label. If it is necessary to use the hazardous substance they must:

- prevent exposure beyond the standard exposure limits
- train employees in the safe use of the substance and ensure they have access to the manufacturer's MSDS
- ensure that any necessary PPE is available and is used
- ensure that all containers are labelled, especially when a hazardous substance is decanted
- ensure that all containers are cleaned when empty
- keep a register of hazardous substances used and a record of training provided.

Some hazardous substances have exposure standards which must be observed. This may be particularly relevant for poisons,

herbicides or pesticides which are applied as a spray. Details of any exposure standards are set out in the manufacturer's MSDS. The *Code of Practice For Control of Workplace Hazardous Substances* provides further information about using hazardous substances. This Code and other guidance material can be obtained from WorkCover NSW.

## 9. Plant

'Plant' is the term used to define all machinery and mechanical equipment, whether mechanically powered or manual. Plant commonly used in the amenity tree industry is considered dangerous.

### 9.1 Plant in general

It is a requirement that an employer or self employed person ensure that:

- hazards are identified
- risks are assessed
- risks are eliminated, or if this is not practical, minimised.

This means analysing how plant might cause injury, how likely it is to occur, and how severe it might be. Then an appropriate work method, or safety device and/or suitable PPE may be adopted to minimise the possibility of somebody being hurt.

There are several ways of controlling risk and these are listed in order of preference:

- eliminate the hazard
- isolate the hazard
- the use of engineering controls - such as suitable guarding
- administrative controls - such as permits to work and having observers near electrical power lines.
- personal protective equipment - such as hearing protection or gloves

The following pages set out some guidance on using specific types of plant.

### 9.2 Cranes and elevating work platforms

#### 9.2.1 Certification

Operators of certain cranes and any elevating work platforms (EWP) that have a reach of 11 metres, must have the appropriate certificate of competency. The legal requirements for certificates are set out in the *Occupational Health and Safety (Certificates of Competency) Regulation 1996*.

Anyone slinging or directing a load should hold at least a Dogging Certificate. A key function of such a person is to correctly estimate the weight of the load.

#### 9.2.2 Training

All operators, including trainees, of cranes and EWPs should be trained in how to operate the particular machine they are using. This training should use the appropriate operator manual and any other relevant information.

#### 9.2.3 Safe working zone

A safe working zone should be set up around the work site using flags, barriers or fencing. Ensure that unauthorised people do not enter the safe working zone. If necessary appoint an observer to ensure that people do not enter the area and to warn the machinery operator if they do. This may be particularly necessary in public areas.

#### 9.2.4 Elevating work platforms (EWP)

A copy of the operator's manual should be kept in every EWP. All operators should have read the manual before operating. Every EWP should have a log book that details the daily, monthly and annual maintenance of the unit. Operators should check the log book and complete it on a daily basis.

Major hazards associated with EWPs include overhead electrical conductors, underground services, roadways, traffic, sloping and soft ground.

Correct tyre pressure is critical for stability of EWPs when outriggers are not being used. If outriggers are required for stability, they should be engaged before operating the boom.

A competent operator should be in the bucket of an EWP when it is being operated. The lower controls should only be used in an emergency. Any person in the bucket must wear a harness with shoulder straps complying with AS1891 Industrial safety belts and harnesses, which must be attached to the specified point in the bucket. If it is necessary for two persons to be carried in an EWP bucket while one of them is operating a chainsaw, care should be taken that all risks associated with this practice are assessed and controlled.

The safe working load of the bucket must not be exceeded. The safe working load includes the weight of the operator, tools and any branches or other debris.

Fuel should not be carried in the bucket of an EWP.

When working on or above roads, appropriate traffic management steps should be implemented.

#### **9.2.4 Cranes**

Any person operating a crane must have the appropriate certificate of competency required under the *Occupational Health and Safety (Certificates of Competency) Regulation 1996*. Any person who slings or directs a load must have the appropriate Certificate of Competency.

The attachment of a person to the hook of a crane to access a tree is not permitted unless authorisation to do this is sought and obtained from WorkCover NSW. This applies to each tree or job. However, WorkCover may grant an authorisation on a tree-by-tree basis.

There should be constant means for clear visual and/or verbal communication between the crane operator, the climber or the ground workers.

### **9.3 Powered machinery**

Powered machinery used in the amenity tree industry can be very dangerous: particularly wood chippers, stump grinders, root pruners and chainsaws. Before using any of these types of machines take the following actions. A copy of the relevant operator manuals should be available and readily accessible at the work site.

Check that the machinery is safe. In particular:

- ensure that it has been maintained in accordance with the manufacturer's specifications or recommendations
- check that all moving parts are adequately guarded and that guards are in place and secure
- check that any blades or cutting or grinding parts are secure and sharp
- check that any safety trips work.

When using powered machinery the operator:

- should wear appropriate PPE such as head, eye and hearing protection
- should avoid wearing anything that could be dragged into the machine or could catch on material being fed into the machine, for example loose-fitting clothing, gloves, watches etc.

#### **9.3.1 Wood chippers**

Before using a wood chipper the operator should check that it has been properly maintained, that guards are securely in place, that blades are sharp and secure and the safety trip works.

The operator should wear appropriate PPE such as head and eye protection and hearing protection. Loose clothing that could be drawn into the machine should not be worn.

The feed chute or feed table of a wood chipper must have sufficient height on its side members to prevent the operator coming into contact with the blades or knives during operation. The outer edge of the chute must be at least 1450 mm from any moving part in which the operator could be entangled.

When using the woodchipper, the operator:

- must use the woodchipper according to the manufacturer's specifications and instructions.
- must not expose the chipper rotor or disc while it is moving, for example by lifting the chute
- must not allow anyone to walk in front of the discharge chute while the disc or rotor is moving.

Wood chippers should be fed from the side of the centre line. The operator should immediately turn away from the feed table when the brush is taken into the rotor.

Remember:

- Never use hands or feet to push material through the chipper. If necessary use longer timber to push material into the chipper.
- The disc or drum of a chipper can take several minutes to stop moving. **KEEP CLEAR!**

### **9.3.2 Stump grinders and root pruners**

Before stump grinding or root pruning check the following:

- services: dial before you dig around the stump looking for loose stones, pipes, concrete or other debris.
- guards securely in place
- teeth on the cutting wheel are sharp and secure, and
- the safety trip works.

The operator should wear appropriate PPE such as eye protection and hearing protection. Loose clothing that could be drawn into the machine should not be worn. When using the stump grinder or root pruner, the operator:

- must be trained and competent in the use of the machine
- must not leave the controls while the cutting wheel is moving
- should avoid working down hill from the machine wherever possible
- must ensure that the cutting wheel is not moving before cleaning excess grindings away from the grinding area.

### **9.3.4 Chainsaws**

Choose the size of a chainsaw appropriate for the work being carried out.

Before using a chainsaw, the operator should check that it has been properly maintained, that the chain is sharp with the correct depth gauge settings and correct chain tension and that the chain break works. The operator should wear appropriate PPE such as head, eye and hearing protection. Loose clothing that could be drawn into the machine should not be worn.

Chainsaws being used on the ground should be started on the ground - they should not be drop started. Chainsaws may be started while being held between the knees. Other people in the area should be warned when the saw is going to be started. A safe working distance from other people should be maintained.



*The safest way to start a chainsaw is on the ground*

When working in a tree, chainsaws can be drop started. The chain saw should be warmed up on the ground, then stopped before being sent up to the climber.

When using a chainsaw in an EWP, the saw should be started outside the bucket and should be attached to the operator or the bucket by a tool strop with a weak link.

Chainsaws should be switched off or the chain brake applied when moving between locations or when placed on the ground. The chainsaw should be switched off for all cleaning, refuelling, adjustments and repairs, except where manufacturer's procedures require otherwise.

A chainsaw should not be used above shoulder height. Steel wedges should not be used in close proximity to chainsaws.

### **9.3.5 Kickback prevention**

- Check that the chain brake works.
- Maintain a sharp chain with the correct depth gauge settings and correct tension.
- Maintain a correct grip.
- Cut at peak revolutions.

- When cutting be aware of where the tip of the bar is at all times.
- Avoid using the kick-back zone of the bar.
- Use two hands and keep a firm grip with the thumb behind the top handle.

## **9.4 Climbing equipment**

Rope should be stored away from all cutting edges, sharp tools, corrosive chemicals, fuel and oil. When stored, rope should be coiled and piled, or suspended, so that air can circulate through the coils.

Rope made unsafe by damage, defect, wear and tear, or for any other reason should not be used.

Rope ends should be sealed, spliced or whipped to prevent fraying or unravelling. Check the breaking strain and calculate the safe working load before use.

All climbing equipment should be thoroughly inspected before use to ensure that it is in a serviceable condition and is safe to use.



**Check ropes and  
other equipment  
before starting work.**

*Check ropes and other equipment before starting work*

### **9.4.1 Climbing rope**

Climbing ropes should meet the following minimum requirements :

- minimum diameter of 11mm
- three-strand, plaited, braided or kermantle construction
- a minimum breaking strain of 3000kg
- made from nylon and/or polyester fibres.

Climbing ropes should never be used for any purpose other than to support a climber. Climbing ropes should not be spliced to make a repair or to lengthen.

#### **9.4.2 Lowering ropes**

When determining the size of the rope to be used the weight of the branch and the distance it free falls until the load is arrested must be considered. As a rough measure, a branch more than doubles in weight for every metre it falls. Lowering ropes should not be joined to extend their length unless consideration has been given to:

- the compatibility of the ropes
- the method of joining and the correct knot
- the lowering system being used (including pulleys and other devices)
- the compatibility of the join with the lowering system, so that the join is able to pass through the system without impeding or compromising the system.

Remember:

Know the history of your rope - a second-hand rope could be lethal.

Ropes can be weakened by:

- knots, bends and hitches
- frays, wear and abrasion
- long-term exposure to UV
- the method of rigging
- fuel, grease, acid or oil
- unsuitable storage
- shock load
- age
- heat or cold

#### **9.4.3 Climbing equipment**

Climbers should be trained in the use of climbing equipment. The manufacturer's instructions should be followed when using, maintaining and storing any climbing equipment. Devices must be compatible with the rope being used.

Mechanical climbing attachments or devices such as ascenders, descenders or karabiners should not be used if they have been dropped.

Ascending devices should be self locking. Mechanical ascenders should have a built in safety catch to prevent accidental release from the rope.

Descending devices should be self locking or used with another device which is self locking.

Remember: Rapid descent may generate enough heat to damage the prussik loop or rope.

### **9.5 Storing and maintaining equipment**

The manufacturer's instructions should be followed when using, maintaining and storing equipment.

All rigging equipment should be marked with its relevant specifications - for example, working load limit. Use only rigging components which are compatible with each other and have similar working load limits.

Never use a shackle in place of a pulley or artificial fork.

All rigging equipment should be inspected for safe operation before and after use.

#### **9.5.1 Climbing spikes**

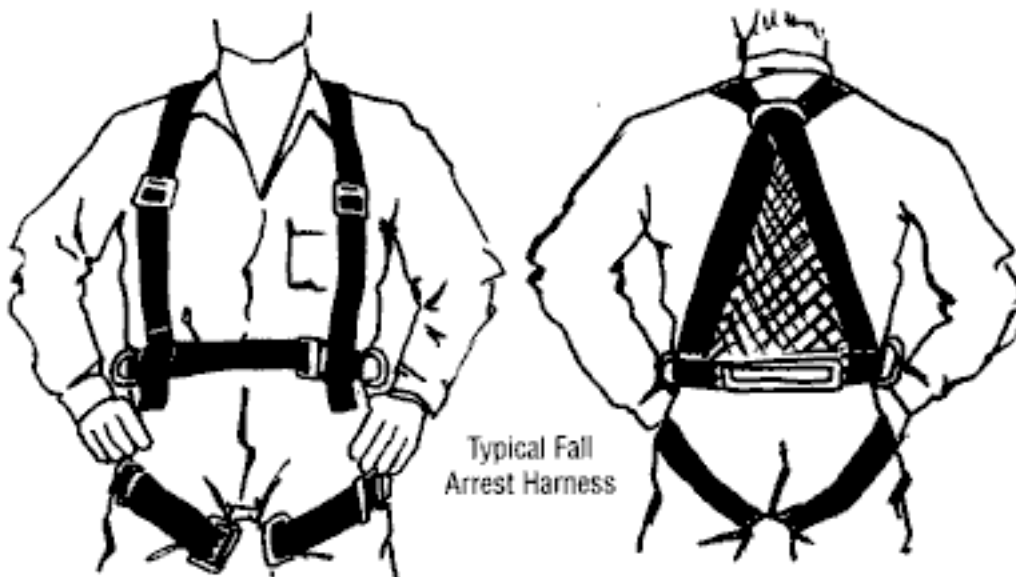
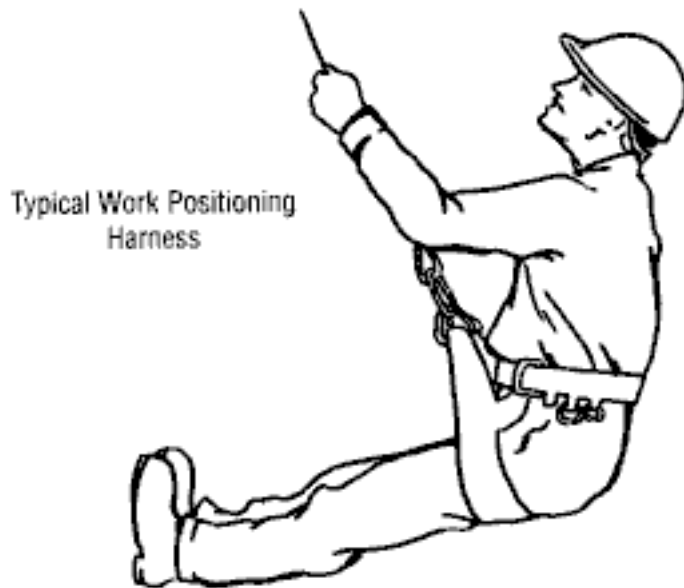
Only use climbing spikes with a work positioning harness and associated equipment. Use spikes designed for tree climbing. Make sure that the spikes are adjusted to suit the leg-length of the climber using them. Spikes should be properly maintained and stored.

Remember:

- Take climbing spikes off when you get back to the ground - or cover the gaffs.
- Sharp gaffs easily puncture legs and feet.

### 9.5.2 Harnesses

Harnesses should be used and maintained in accordance with Australian Standard AS 2626: *Industrial Safety Belts and harnesses - Selection Use and Maintenance*. The manufacturer's instructions should be followed when fitting, maintaining and storing a harness. Pole belts of webbing, rope, or steel core may be used. Work positioning harnesses should not be used if there is a risk of a free fall of more than 600mm.



*Harnesses*

### 9.5.3 Ladders

When a ladder is required to access a tree, a climbing harness and system should be used. The climber should establish a suitable anchor point before leaving the ground. The ladder should be steadied by a ground worker and be removed once the climber leaves it. If it is necessary to work from a ladder:

- ladders should be inspected before use and should only be used if in good working order
- metal or wire reinforced ladders should not be used where an electrical hazard exists
- the climber should attach the climbing rope to an anchor point independent of the branch being removed
- the climbing rope should be long enough for the climber to reach the ground
- the ladder should be significantly taller than the branch being cut to allow for any sudden upwards movement of the branch once it is cut.

Remember:

- Take special care when using ladders.
- Avoid dropping timber near the base of the ladder.
- Make sure the base of the ladder is stable.

## **10. Work practices**

### **10.1 Climbing**

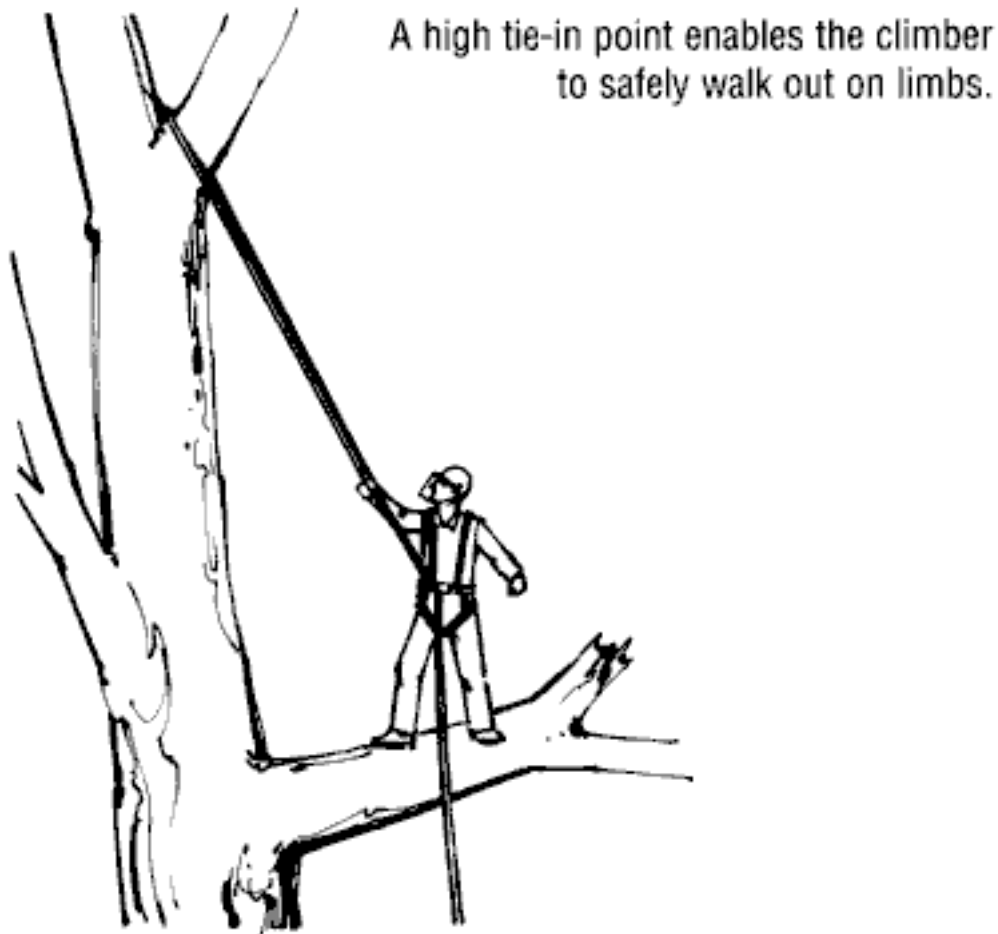
Before work commences a competent person

should be nominated to control work. The competent person must assess any risks associated with the tree and the site, plan the work, instruct crew members in the work procedures and ensure that all personnel are appropriately trained and fit.

Climbers should constantly assess risks. Identification, assessment and control of these risks should be an ongoing process. All people engaged in tree work should wear head and eye protection. Other PPE may be required as explained in Section 6.

Climbing equipment should comply with any relevant standards, be maintained and stored according to the manufacturer's specifications. Any defective equipment should be identified, labelled as defective and destroyed. Climbers should be attached to the tree at all times including when changing positions or attachment points. The climbing rope should be passed around a structurally sound anchor point which has sufficient strength to allow for a safe working load.

The anchor point should be above the work area or as close as possible to it. It should provide the safest working angle and position. The climbing rope should be kept taut at all times.



*A high tie-in point enables the climber to safely walk out on limbs*

If the tree does not have suitable natural anchor points (eg palms and other trees with similar growth habits) alternative methods of access or artificial points of attachment should be used.

An accepted climbing system should be used. If a climbing rope is part of the system, then a stopper knot should be tied at the loose end. A bowline should not be used in any part of the climbing system unless a stopper knot is used.

Remember:

Whenever the position of the climbing rope is changed or knots have to be retied, the following checks should be made:

- karabiners are securely closed
- knots are properly tied
- pole belt is secure
- branch will support climber.

## **10.2 Work in trees**

Before anyone works in a tree, set up and maintain a safe working zone. Ensure ground staff prevent any pedestrian traffic or vehicles from entering the zone. When transferring equipment to the climber in the work position, ensure that the equipment does not inadvertently cause damage to ropes.

Remember:

When working with equipment in a tree, a climber should have two points of attachment.

If a climber carries equipment, ensure the total weight of the climber and the equipment is within the safe working load of the climbing system. When working with equipment in a tree, a climber should have two points of attachment. When working near electrical conductors, do not select an anchor point which would cause the worker to swing into the conductors or any other hazards.

Chainsaws should only be used in trees by trained and competent climbers or trainees under supervision. Chainsaws should be attached to the climber's harness by a tool strop with a locking device. The strop should be long enough to allow the saw to hang below the climber's feet and should have a weak link to permit failure if there is an excessive load. Climbers should not start chainsaws unless they are in a safe and stable working position. The saw should be started close to the working position. Ensure that the saw is clear of obstacles before starting. Drop starting is permitted.

Use two hands to operate a chainsaw. Do not operate the saw above shoulder height.

Switch the chainsaw off when moving between work positions. Apply the chain brake between cuts.

A clear warning must be given to ground workers that a branch is going to be cut, dropped or lowered.

Choose only appropriate knots. Attach a lowering rope (or ropes) to branches that cannot be dropped safely or that are too heavy to be controlled by hand. If necessary attach an additional pull rope to help steer the branch to the ground.

Never use the climbing rope to lower branches.

Never leave any cut branches hanging in trees.

Remember:

When lowering branches:

- check the safe working load of the lowering system
- ropes should be the correct length
- anchor points should be sound and strong
- use a different tree fork or artificial anchor point for the lowering rope and the climbing rope
- ground workers must be able to control the branch
- control of the branch must be maintained at all times.

### **10.3 Ground work**

Ground workers are responsible for:

- setting up and maintaining a safe working zone and controlling traffic
- communicating with climbers
- keeping the climber's rope free of debris and entanglements
- providing the climber with equipment
- helping to lower branches and equipment
- helping the climber to assess anchor points and work systems
- keeping the site clear of debris.

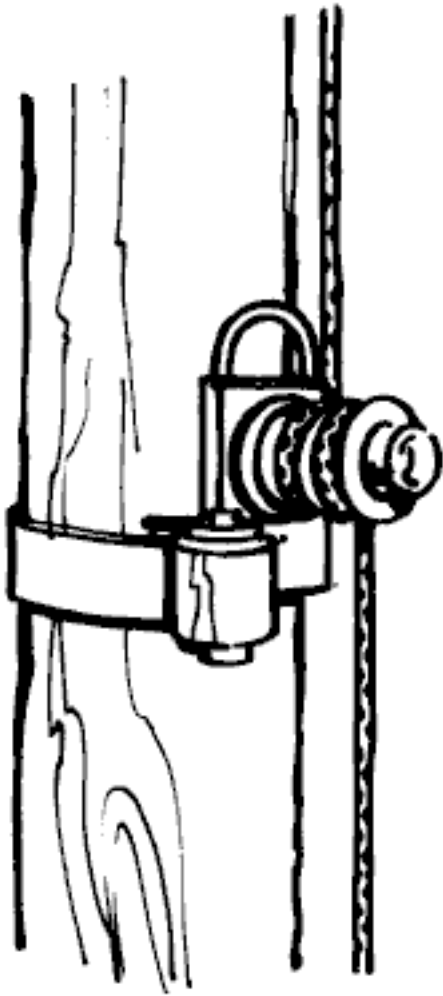
Ground workers should wear head and eye protection. Other PPE may be required as explained in Section 6.

Ground workers should maintain visual and verbal contact with the climber and with any loads being lowered or raised. They should not stand under the load.

Before winching, lifting or lowering a load, the working load limit should be determined.

Never stand in the direct line of a tensioned winch cable or tow-rope.

Lowering devices and systems are useful when handling loads. Ground workers must not wrap ropes around any part of the body and must ensure that the lowering ropes are long enough.



A lowering device can be used to control heavy loads.

*A lowering device can be used to control heavy loads*

#### **10.4 Cliff and difficult sites**

Tree workers may need to work on difficult sites such as cliff faces, steep slopes and retaining walls. On these difficult sites the practices set out in the sections on 'Climbing' and 'Work in Trees' in this code, should be followed. Reference should also be made to 'Industrial Rope Access Guidelines'.

If rope is being used for support, in some cases two independent ropes may be required.

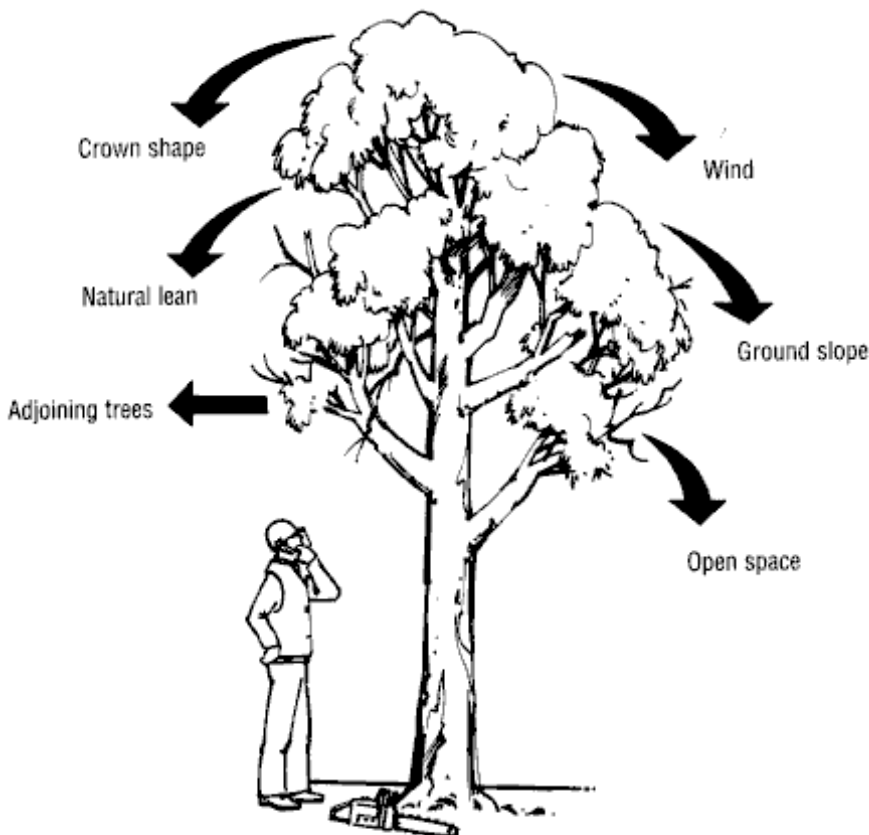
## 10.5 Felling

A safe working zone should be set up and maintained when felling a tree. The zone should extend for at least twice the height of the tree. Clear the safe zone of any debris and identify an escape route for an area 45 degrees behind the line of fall of the tree.

Trees should not be felled by means of powered mobile plant unless a risk assessment has been undertaken which determines that risks have been controlled. Any mobile plant should be appropriately guarded and operated by a competent person.

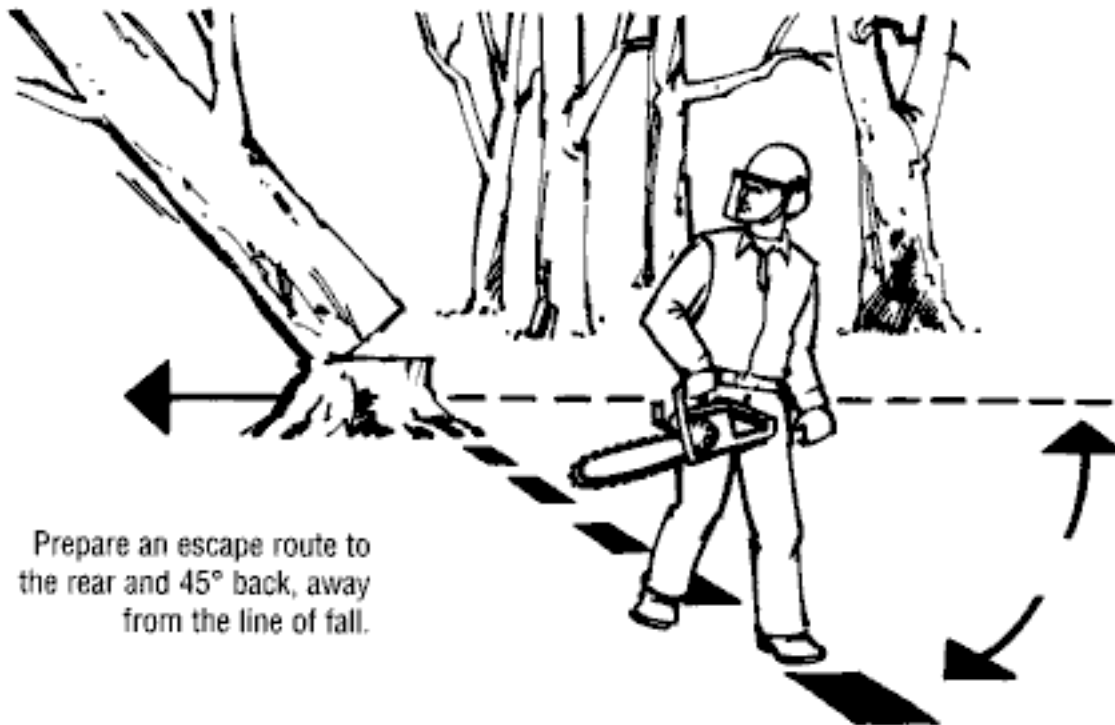
A competent person should be nominated to control the work and assess the risks. This assessment should consider:

- the soundness of the tree
- the shape and weight distribution of the canopy
- the presence of hangers in the canopy
- the lean of the tree
- the wind force, direction and consistency of wind
- proximity of the tree to services such as overhead powerlines
- nature of the terrain
- the location of structures, people and traffic.



Study the tree before starting work

*Study the tree before starting work*



*Prepare an escape route to the rear and 45 degrees back, away from the line of fall*

Felling of trees that are rotten, split or have a lean should only be undertaken by a person experienced in this type of work.

Suitable equipment (such as wedges), should be used to prevent a tree falling in a direction other than that intended. A scarf and back-cut should be used in felling trees over 200mm in diameter measured at approximately breast height. The operator should move away from the tree, along the planned escape route as the tree begins to fall.

## 10.6 Limbing and bucking

The tree worker should stand on the uphill side of the work. Any log which might roll should be chocked into position. Care should be taken to ensure that workers are aware of tension and compression factors.

## 11. Terminology

**"Amenity tree industry "** All people who work with trees excluding commercial forestry. This could include the following occupations (this is not a comprehensive list): arborists, tree climbers, tree loppers, gardeners, horticulturists, landscapers, tree workers, builders and developers, earth movers and site clearers, firewood contractors, tree transplanters, stump grinders, wood chippers.

**"Anchor point (natural) "** Any fork formed by the junction of two branches or a branch and the trunk, which can be used safely by a climber as a point for the climbing or lowering rope.

**"Anchor point artificial "** A device installed in a tree to serve as an anchor point. This could include a pulley and sling assembly.

**"Aerial rescue "** Method used to bring an injured worker down from a tree or aerial lift device.

- "**Ascender**" A knot or mechanical device used for ascending a rope and positioning the climber in the tree.
- "**Backcut**" The final release cut made on the opposite side of the trunk to the scarf in a felling operation.
- "**Blocking**" The dismantling of the trunk of a tree by the gradual removal of manageable sections, subsequent to the removal of the canopy.
- "**Boom-type elevating work platforms**" A telescoping device, hinged device, or articulated device or any combination of these used to support a platform on which personnel, equipment and materials may be elevated to perform work. Excluded from this definition are elevating work platforms of less than 11 metre boom length.
- "**Branch rope**" A rope used by the climber for lowering heavy branches or other parts of the tree. May also be used as a tool line.
- "**Bucking**" Sawing a felled tree or limbs into smaller sections also known as cross-cutting.
- "**Cabling**" Installation of hardware into a tree to help support weak branches.
- "**Chaps**" A form of leg protection worn when operating a chainsaw.
- "**Climbing device**" Attachment between a climber's harness and the ropes which allows the climber to ascend or descend.
- "**Climbing rope**" Rope by which a climber attaches to a tree.
- "**Competent person**" A person who has acquired through training, qualification or experience or a combination of these, the knowledge and skills enabling that person to perform the tasks required by this Code.
- "**Crane**" An appliance for raising or lowering a load, and moving it horizontally. This definition does not include: any industrial lift-truck, earthmoving machinery, amusement structure, tractor, industrial robot or lift; or any front-end loader, backhoe, excavator or similar plant configured for operation as a crane; or any non-slewing mobile crane with a capacity of 3 tonnes or less or used only for towing vehicles.
- "**Climbing spikes**" A pair of climbing aids which attach to the climber's lower legs and which are comprised of gaffs or spikes, calf and foot supports, straps and pads.
- "**Craning fork**" Any fork (in addition to the anchor fork) formed by the junction of two branches or a branch and a trunk, which can be used safely as a load bearing fulcrum point for a branch rope.
- "**Cross-cutting**" Sawing a felled tree or limbs into smaller sections: also known as bucking.
- "**Descender**" A knot or mechanical friction device used in conjunction with a rope to enable descent from a tree in a safe and controlled manner.
- "**Drop zone**" Any area in which parts of the tree may be felled or dropped.
- "**Fall arrest harness**" A single assembly of interconnected shoulder and leg straps with or without a body belt: it should be adjustable and incorporate attachment hardware.
- "**Felling**" The felling of an entire or section of a tree at ground level.
- "**Ground staff**" Workers on the ground who are assigned to assist the climber and perform duties other than those undertaken by the climber.
- "**Hanger**" Detached or partially detached branches which remain lodged in the canopy.
- "**Harness**" An approved assembly of interconnected webbing worn where there is the likelihood of free or restrained fall. Should be manufactured to Australian Standards. See also fall arrest harness and work positioning harness.
- "**Holding wood (hinge)**" Section of timber left uncut between the scarf and backcut.
- "**Hazard**" The potential to cause injury – for example, a fall from a tree.
- "**Hazardous substances**" Substances which can harm health by getting into the body, for example, by being breathed in, absorbed into the skin or eyes, or swallowed accidentally. They can be pure substances or mixtures. Some dusts, fumes and the by-products of chemical processes may be hazardous substances.
- "**Karabiner**" Metal, self-closing, lockable device to which ropes can be securely attached.
- "**Kickback**" Sudden backward or upward thrust of a chainsaw.
- "**Kickback zone**" The upper quadrant of the guide bar nose.
- "**Lanyard**" A short length of synthetic fibre rope used to attach a safety harness or body belt to an anchorage.

"**Limbing** " Removal of limbs from a fallen tree.

"**Lowering device** " Instrument attached to the base of a tree in rigging, used to take wraps with the lowering rope.

"**Lowering rope** " A rope used to lower branches or other parts of the tree. May also be used as a tool line.

Sometimes known as a branch rope.

"**Maillon rapide** " A metal, screw locking, semi-permanent joining link.

"**Place of work** " Premises or any other place where persons work.

"**Pole belt** " An approved rope, lanyard, belt or flip line which is attached to two separate points on the climber's harness and which positions the climber in the tree.

"**Principal contractor** " The person responsible for the construction work. The principal contractor may be regarded as an employer or the person in control under the Occupational Health and Safety Act.

"**Pull rope** " Rope used in rigging or removals to direct the fall or swing of a branch or any other part of the tree.

"**Prussik loop** " A climbing device which consists of a loop of rope smaller in diameter than the climbing rope which is attached to the climbing rope with a prussik knot and which is used to attach the climber to the climbing rope.

"**Risk** " The potential of injury or damage posed by a hazard – for example, a fall from a tree.

See Section 9.4

"**Safe working load** " The maximum load which may be applied to a crane, hoist, rope, chain or sling for particular conditions of use.

"**Scarf** " Two cuts made to form a notch which determines the direction of fall when felling or topping, or direction of break when removing a branch.

"**Shock load** " The dynamic load placed on a rope or rigging apparatus when a moving object or person is stopped.

"**Tool rope** " A separate rope used by the climber to raise or lower equipment.

"**Tool strop** " Rope or webbing which attaches the climber's tools to the harness. This should incorporate a weak link.

"**Topping** " The removal of the upper canopy of a tree performed in one operation by means of felling whilst aloft in the tree.

"**Weak link** " A material of a known breaking strain which will break before damage or injury occurs.

"**Workplace** " See place of work

"**Working load limit** " The maximum load which can be applied under general conditions of use to a crane hoist, rope, chain, sling or item of lifting gear.

"**Work positioning harness** " An assembly of a body belt and buttock strap for use as a work positioning device and for use where there is the likelihood of restrained fall only.

"**Work zone** " Anywhere work is being done and access ways between such zones.

## Appendix Hazard Assessment checklist

Hazard	Assessment Factors	Control measures
Site	Overhead powerlines	<ul style="list-style-type: none"> <li>• trained staff</li> <li>• safe working distances</li> <li>• appropriate equipment</li> </ul>
	Underground services Vehicular & pedestrian traffic	<ul style="list-style-type: none"> <li>• accurate detection</li> <li>• signs etc</li> <li>• adequate staff</li> </ul>
	Adjacent buildings Terrain & access	<ul style="list-style-type: none"> <li>• safe working distances</li> <li>• appropriate equipment</li> </ul>
Weather	Rain, wind snow, ice, sun	<ul style="list-style-type: none"> <li>• UV protection</li> <li>• modify work practices to suit conditions</li> </ul>
Tree	Hanging branches, included bark, epicormic shoots, fungal brackets, cavities, cracks or splits, bees or wasps, termites, previously split or torn branches, root damage, stability, wood reaction	<ul style="list-style-type: none"> <li>• through inspection</li> <li>• appropriate equipment</li> <li>• trained staff</li> </ul>
Equipment	Ropes	<ul style="list-style-type: none"> <li>• SWL not exceeded</li> <li>• ropes checked for wear and tear</li> </ul>
	Harness	<ul style="list-style-type: none"> <li>• checked for wear and tear and damage to stitching and D-rings</li> </ul>
	Pole Belts	<ul style="list-style-type: none"> <li>• clips, webbing in good working order</li> </ul>
	Saws	<ul style="list-style-type: none"> <li>• chainbrakes in working order</li> <li>• appropriate size for the job</li> <li>• trained operators</li> <li>• correct chain tensioning &amp; sharpening</li> </ul>
	Safety equipment (eg PPE, signs, witches hats, first aid kits)	<ul style="list-style-type: none"> <li>• adequate number</li> <li>• appropriately positioned</li> </ul>
Machinery	Cranes and EPWs	<ul style="list-style-type: none"> <li>• designed, used and maintained to appropriate standards</li> <li>• licensed operators</li> <li>• in good order</li> </ul>
	Wood Chippers	<ul style="list-style-type: none"> <li>• trained staff</li> <li>• appropriate size for the job</li> <li>• safety signs</li> <li>• sharp knives</li> <li>• suitable guards</li> </ul>
	Stump Grinders & Root Pruners	<ul style="list-style-type: none"> <li>• sharp blades/teeth</li> <li>• trained staff</li> <li>• appropriate guards</li> <li>• safety signs</li> </ul>
Staff	Training	<ul style="list-style-type: none"> <li>• adequate training</li> </ul>
	Numbers	<ul style="list-style-type: none"> <li>• enough people on the site</li> </ul>
	Job Allocation	<ul style="list-style-type: none"> <li>• planning</li> </ul>

